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SOME STATISTICAL PROBLEMS CONNECTED WITH THE WORLD'S STOCK OF GOLD.

By Francis B. Forbes.

I have recently had occasion to examine the statistics of the world's stock of gold money, as published by the United States Mint Bureau for the ends of the years 1904 and 1905. The Director submits these reports as giving "the best information obtainable, although unsatisfactory in many respects," and I myself have found several obscure points which seem to need further study. I have therefore tried to state them here in some detail, with the hope that statisticians may be interested in trying to clear them up.

I.

As far as possible, the Mint has given for each country the stock of gold in Banks and Treasuries and the amount in circulation, but from many nations no figures for circulation are obtainable, and in a few cases there are no reports of any kind.

As regards the holdings of Banks and Treasuries, the Mint Director considers them to be substantially accurate, as they are all derived from official sources, while the estimates of gold in circulation "obviously, in every case, must be only an approximation."

The Mint's latest published report gives the estimated increase in the world's stock of gold money on December 31, 1905, as $496,400,000 over the corresponding figures for the close of 1904. As to this, the Director remarks, "As this amount largely exceeds the year's production, of course no such increase actually occurred, but must be accounted for in part by changes from the provisional estimates," previously reported.

Students of monetary history can hardly refrain from some expression of regret that the Director of the Mint had not seen his way to supplement the few lines just quoted by a further attempt to explain the enormous discrepancy in the statistics. A study of his detailed figures may, however, serve to throw a little light on the question:—

			Million $
The total reported increase in the world's stock of gold money during 1905 was			496.4
While the world's total gold product in 1905 was		376.3	
From this must be deducted:—			
(1) Gold used industrially, reported by the Mint as	85.1		
(2) Loss by abrasion of coins and by casualties, of which a low estimate * is	8.5	93.6	
Making *total gold product for the year available for money to be only*			282.7
Apparently, therefore, the increase in the stock of gold money exceeded the total available product of gold by			$213.7

A detailed analysis of the Mint Statistics (Tables A to D) shows that, taking the accurate figures for Banks and Treasuries, the increases and decreases in European countries at the end of 1905 balanced within less than $2,000,000. It also appears that more than all of the total net increase of $104,700,000 under this heading occurred in North and

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* See my paper on "Gold and Commodity Prices" in *Publications of American Statistical Association*, June, 1906.

South America, the United States alone showing an increase of $68,000,000.

On the other hand, out of a total estimated net increase of $391,700,000 in circulation, $317,600,000 are reported in Europe; but, out of twenty countries in the list, nine have furnished no information under this heading.

II.

Of all the published figures for European countries, only those for Russia seem open to grave question. A reference to Table B shows that during 1905 the Russian Banks and Treasury lost $92.2 millions, or 17½ per cent. for the year, while the gold circulation increased by $163.4 millions, or nearly 64 per cent.! Now, even supposing that the $92 millions withdrawn from her Banks and Treasury all passed into her own circulation, the statistics of Russia would still show a net gain for the year of $71 millions gold, or about as much as the United States had been able to retain during the same twelve months.

But the Russian Government has always kept a tight grip on the nation's gold, and during the few years since the currency was reformed they must have been able to follow the course of almost every gold coin issued. The net withdrawals from Banks and Treasury for 1905 are not likely to have gone anywhere except abroad for debt and war charges. Furthermore, it is hardly conceivable that, in the face of crushing military disaster, of landed and agricultural distress, and of revolutionary unrest, there should have been any such notable increase in Russian gold circulation during that year.

III.

Nevertheless, the Mint Bureau may, perhaps, be asked to qualify their general statement that, where the reported increase of the world's gold money exceeds the total available product of that metal for the same year, "*of course no such* *increase actually occurred.*" It is, however, only fair to the Mint Bureau to assume that they had chiefly in mind such abnormal movements in a single year as purport to bring about an increase of gold money in Banks, Treasuries, and circulation of nearly double (1¾) the total available output.

But there are ways in which such an increase might be more gradually brought about. Without attempting to give an exhaustive list, I wish to offer some suggestions about three sources, the combined influence of which might be very important: (1) Gold Hoards; (2) Coinage of Gold previously manufactured; (3) the invisible Movements of Gold in Asia.

Hoards. In many countries, not in the first rank of civilization, private hoarding of the precious metals has gone on from time immemorial. Such hoarding has by no means been confined to the poorer classes; and, owing to the greatly diminished value of silver measured in gold since 1873–74, it is probable that more gold than silver has been hidden away. Special circumstances may bring these hoards into circulation throughout a whole group of countries at about the same time.

Gold used industrially. According to the Mint estimates for the ten years 1895–1904, the annual industrial consumption of gold averaged some $70,000,000. This figure is now raised well over $80,000,000 a year, so that it is easy to see what a vast quantity of this metal must now exist in the form of plate, jewelry, bangles, and other ornaments throughout the world. In moments of public danger or disaster large amounts of such manufactured gold are known to be melted down for coinage, and the same thing must often happen in the ordinary course of trade.

Asia. The movements of gold in the central part of this continent must have a certain importance, but they almost entirely elude statistical record. The gold product of Siberia should naturally be included in the Russian official figures, though it may be doubted whether account is kept of the amounts passing by trade routes into Central Asia, Mongolia, and China. In like manner, the sea-borne imports or exports of gold into or out of India are fully reported in the official returns, but I have never been able to find statistics of the gold moved by the caravan trade with Central Asia.

The Mint report shows for 1905 a decrease of $33,600,000 in the gold money stocks of Indian Banks and Treasuries, with an increase of $46,700,000 in circulation, or a net absorption of $13,100,000. But it is impossible to say how much more gold was retained during the year by a country where nearly every native, from the Maharajahs down, has the habit of hoarding.

IV.

The case of China requires a more extended discussion. There gold is not money, but a commodity, and naturally the Mint has no figures for Chinese gold stocks, while other statistics about the metal are scant and unsatisfactory.

For instance, the Mint reports the gold product of China for the six years 1900–05 as $37,000,000 of our money,—say an annual average of $6,167,000. At first sight these figures appear inadequate. According to a synopsis of Chinese Customs Reports which I have made for the previous ten years, 1890–99, gold had been exported from the treaty ports to the amount of 71,605,000 Haikwan Taels. Taking the official sterling valuation of the Tael for each year, this would be over $58,000,000 of our money,—an annual average of $5,800,000, nearly equal to the total average product during later years. But during that period gold had certainly been exported through other outlets than the treaty ports, and part of the product had always remained in the country.

On the other hand, it is probable that, during the ten years 1890–99, more of the gold product of Korea had found its way abroad through Chinese treaty ports than has been the case since then. Very probably, also, the output of the Chinese Northern mines themselves was materially curtailed during the Russo-Japanese troubles and the war which followed. The Korean gold product for the six years 1900–05 is given by the Mint as $18,750,000. Dealing, however, only with the output of China itself during this period ($37,000,000), it must be confessed that the gold movements reported by the Chinese Customs are very puzzling. The figures are as follows, in the gold equivalents of Haikwan Taels:—

GOLD MOVEMENTS FOR THE YEAR 1900–1905, COMPILED FROM CHINESE CUSTOMS REPORTS.

Year.	Details.	U.S. Gold $ 000's omitted.	
		Net Imports.	Net Exports.
1900		$913	
1901			$4,777
1902			5,928
1903	Imports and exports each about 4,000,000 Haikwan Taels,—$2,560,000, treated as balanced		
1904	*Imports* (of which 9,678,000 in Japanese gold coin), Haikwan Taels 9,930,000		
	Exports of uncoined gold from northern ports, Haikwan Taels 1,484,000		
	Net imports, Haikwan Taels 8,446,000	5,912	
1905	*Imports* (of which 10,692,000 in Japanese gold coin), Haikwan Taels 11,109,000		
	Exports, Haikwan Taels 4,050,000		
	Net imports, Haikwan Taels . . . 7,059,000	5,153	
	Totals	$11,978 10,705	$10,705
	Net gold imports for six years	$1,273	

Now these figures by themselves are misleading, as the Statistical Secretary of the Chinese Customs is careful to point out. The Japanese gold coins imported in 1904 and 1905 had no connection with the proper trade of China, but were sent to Shanghai for sale, as an exchange operation, which evidently took a long time. We have, therefore, in these two years, imports of foreign coin, valued at 20,370,000 Haikwan Taels, or $14,580,000, which, if such a thing had been practicable, should have been treated as a sort of "suspense account."

In his report for 1905, however, the Statistical Secretary hit upon a plan for estimating movements of the precious metals which must manifestly come closer to actual facts than the former system of his office. Recognizing that for some forty years Hongkong has been the banking centre of Chinese foreign trade, he obtained approximate accounts of the Colonial imports and exports of gold and silver. He combined these with his own treaty port figures, and so is able to publish results for what he terms the "commercial area" of China.

His interesting figures are given here in slightly different form from his own:—

MOVEMENTS OF THE PRECIOUS METALS IN THE "COMMERCIAL AREA" OF CHINA FOR THE YEAR 1905.

Haikwan Taels, 000's Omitted.

	Imports.			Exports.		
	Gold.	Silver.	Total.	Gold.	Silver.	Total.
Trade between Chinese treaty ports and foreign countries, including Hongkong	11,109	31,428	42,537	4,050	38,624	42,674
Deduct Hongkong	94	19,416	19,510	1,562	32,556	34,118
	11,015	12,012	23,027	2,488	6,068	8,556
Add trade between Hongkong and other places than Chinese treaty ports	4,065	8,180	12,245	8,540	3,366	11,906
Figures for Chinese "commercial area"	15,080	20,192	35,272	11,028	9,434	20,462

From this table it appears that, while for the treaty ports of China the imports and exports of both precious metals nearly balanced, the "commercial area" showed a net import of some 15,000,000 Haikwan Taels, or nearly $11,000,000.

It may be noted that the Statistical Secretary has elsewhere estimated, from the accounts of Commissioners in several Southern ports, that the sums in hard cash brought back by returned Chinese emigrants amount to at least 10,000,000 Haikwan Taels annually, adding that "these sources of invisible supply are sufficient to counterbalance the visible excess of exports of coins" from treaty ports. How much of this import may be in gold is unknown.

As to the gold movements in 1905, we find that, as against a net import into the treaty ports of 7,059,000 Haikwan Taels, the net import into the "commercial area" was only 4,052,000 Haikwan Taels, or less by 3,007,000 Taels ($2,195,000). If we had such figures as these for both 1904 and 1906, we should probably see that exports from the "commercial area" had already reduced the above-mentioned "suspense account" to insignificant proportions. At the same time it is evident that the published Customs Reports, admirably accurate as far as they go, cannot possibly give all material facts even for the commerce of the treaty ports alone.

Beyond these there is also a great trade across the Northern and Western frontiers of China for which absolutely no official statistics are available. But I remember well that, some thirty years ago when I was in business in Shanghai, I had collected with great trouble certain leading facts about Chinese trade with part of Central Asia, and that an approximate balance was possible only by assuming an annual export of gold from China. Unfortunately, when I retired from Shanghai in 1882, I left behind me all the papers connected with this investigation.

V.

There appear, then, to be gold movements from Siberia, India, and China into Central Asia which are certainly worth taking into account. All are very hazy as to both values and direction of current, but, in view of Europe's power to attract gold, it would seem that any surplus of this metal must naturally drift from Asia into Russia.

To sum up. I have drawn special attention to several sources from which gold may filter into Banks and circulation so as to disturb the ordinary statistics. In the early part of this paper I gave reasons for discrediting an increase in Russian gold circulation of over sixty per cent. in a single year, but I think that those who have cared to follow my discussion will have been struck, as I have been myself, by what can hardly be a mere coincidence.

When we consider these unrecorded movements of gold during recent years, whether by dispersion of hoards, or by melting down of plate and ornaments, or by the specie balances of Central Asiatic trades, it is hard to suggest any country but Russia where a combination of all three influences can have added appreciably to European stocks or circulation of the yellow metal.

It is evident that the missing statistical links can be forged only if the United States Mint is able to count on a more zealous co-operation from the foreign governments concerned than some of them appear to have given heretofore. Our Mint Bureau undertakes to compile for the general benefit a most valuable set of monetary statistics, and it does not seem over-sanguine to expect that a little more friendly pressure from Washington might end in getting what is wanted from the others.

WORLD'S STOCK OF GOLD MONEY ON DECEMBER 31ST OF 1904 AND 1905.

Compiled from United States Mint Reports.

Table A.	Banks and Treasuries. Million $.				Circulation. Million $.				Totals. Million $.			
NORTH AND SOUTH AMERICA.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.
United States	887.8	955.8	—	**68.0**	460.4	465.0	—	**4.6**	1,348.2	1,420.8	—	**72.6**
Canada	52.5	53.1	—	**.6**	—	—	—	—	52.5	53.1	—	**.6**
Cuba	20.0	20.0	—	—	—	—	—	—	20.0	20.0	—	—
Mexico	8.6	8.6	—	—	—	—	—	—	8.6	8.6	—	—
Haiti	1.0	1.0	—	—	—	—	—	—	1.0	1.0	—	—
South American States:												
Argentina	72.1	90.2	—	**18.1**	—	9.8	—	**9.8**	72.1	100.0	—	**27.9**
Bolivia	.4	.4	—	—	—	—	—	—	.4	.4	—	—
Brazil	—	—	—	—	—	—	—	—	—	—	—	—
Chile	9.5	31.6	—	**22.1**	—	10.0	—	**10.0**	9.5	41.6	—	**32.1**
Colombia	.2	.3	—	**.1**	—	—	—	—	.2	.3	—	**.1**
Ecuador	1.7	1.7	—	—	—	—	—	—	1.7	1.7	—	—
Guiana, British . . .	—	—	—	—	—	—	—	—	—	—	—	—
Guiana, Dutch . . .	1.0	.1	**.9**	—	—	—	—	—	1.0	.1	**.9**	—
Guiana, French . . .	—	—	—	—	—	—	—	—	—	—	—	—
Paraguay	.1	.1	—	—	—	—	—	—	.1	.1	—	—
Peru	3.9	2.9	**1.0**	—	—	3.9	—	**3.9**	3.9	6.8	—	**2.9**
Uruguay	11.2	15.5	—	**4.3**	—	—	—	—	11.2	15.5	—	**4.3**
Venezuela	.7	.5	**.2**	—	4.8	4.8	—	—	5.5	5.3	**.2**	—
Central American States.	2.0	2.6	—	**.6**	—	—	—	—	2.0	2.6	—	**.6**
Totals	1,072.7	1,184.4	**2.1**	**113.8**	465.2	493.5	—	**28.3**	1,537.9	1,677.9	**1.1**	**141.1**
Net differences in 1905				**111.7**				**28.3**				**140.0**

WORLD'S STOCK OF GOLD MONEY ON DECEMBER 31ST OF 1904 AND 1906.

Compiled from United States Mint Reports.

Table B.	Banks and Treasuries. Million $.				Circulation. Million $.				Totals. Million $.			
EUROPE.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase,	1904.	1905.	Decrease.	Increase.
Austria-Hungary . . .	240.0	246.4	—	**6.4**	65.0	60.9	**4.1**	—	305.0	307.3	—	**2.3**
Belgium	19.1	19.6	—	**.5**	10.9	10.9	—	—	30.0	30.5	—	**.5**
United Kingdom	194.0	188.1	**5.9**	—	339.2	371.0	—	**31.8**	533.2	559.1	—	**25.9**
France	519.7	555.5	—	**35.8**	406.7	477.1	—	**70.4**	926.4	1,032.6	—	**106.2**
Germany	197.3	170.5	**26.8**	—	689.4	746.9	—	**57.5**	886.7	917.4	—	**30.7**
Italy	131.4	189.5	—	**58.1**	—	—	—	—	131.4	189.5	—	**58.1**
Russia	526.9	434.7	**92.2**	—	256.8	420.2	—	**163.4**	783.7	854.9	—	**71.2**
Spain	72.1	74.1	—	**2.0**	—	—	—	—	72.1	74.1	—	**2.0**
Turkey	10.0	10.0	—	—	40.0	40.0	—	—	50.0	50.0	—	—
Bulgaria	1.9	7.2	—	**5.3**	—	—	—	—	1.9	7.2	—	**5.3**
Denmark	17.4	20.9	—	**3.5**	—	—	—	—	17.4	20.9	—	**2.5**
Finland	4.4	4.4	—	—	—	—	—	—	4.4	4.4	—	—
Greece	5.4	5.4	—	—	.2	.2	—	—	5.6	5.6	—	—
Netherlands	27.2	31.8	—	**4.6**	9.3	9.2	**.1**	—	36.5	41.0	—	**4.5**
Norway	6.8	7.6	—	**.8**	—	—	—	—	6.8	7.6	—	**.8**
Portugal	5.3	5.3	—	—	—	—	—	—	5.3	5.3	—	—
Roumania	10.4	15.0	—	**4.6**	—	—	—	—	10.4	15.0	—	**4.6**
Servia	3.3	3.7	—	**.4**	—	—	—	—	3.3	3.7	—	**.4**
Sweden	17.0	18.4	—	**1,4**	3.2	3.2	—	—	20.2	21.6	—	**1.4**
Switzerland	20.7	20.5	**.2**	—	8.9	7.6	**1.3**	—	29.6	28.1	**1.5**	—
Totals	2,030.3	2,028.6	**125.1**	**123.4**	1,829.6	2,147.2	**5.5**	**323.1**	3,859.9	4,175.8	**1.5**	**317.4**
Net differences in 1905			**1.7**					**317.6**				**315.9**

WORLD'S STOCK OF GOLD MONEY ON DECEMBER 31ST OF 1904 AND 1905.

Compiled from United States Mint Reports.

Table C.	Banks and Treasuries. Million $.				Circulation. Million $.				Grand Totals. Million $.			
ASIA, AFRICA, AND AUSTRALASIA.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.
India	53.3	19.7	**33.6**	—	210.6	257.3	—	**46.7**	263.9	277.0	—	**13.1**
Japan	42.7	59.4	—	**16.7**	10.1	10.5	—	**.4**	52.8	69.9	—	**17.1**
Siam	1.0	—	**1.0**	—	—	—	—	—	1.0	—	1.0	—
China	—	—	—	—	—	—	—	—	—	—	—	—
Egypt	12.0	12.0	—	—	75.0	75.0	—	—	87.0	87.0	—	—
South Africa	41.0	36.5	**4.5**	—	15.0	15.0	—	—	56.0	51.5	**4.5**	—
Australasia	111.6	128.7	—	**17.1**	17.0	15.7	**1.3**	—	128.6	144.4	—	**15.8**
Totals	261.6	256.3	**39.1**	**33.8**	327.7	373.5	**1.3**	**47.1**	589.3	629.8	**5.5**	**46.0**
Net differences in 1905			**5.3**					**45.8**				**40.5**

WORLD'S STOCK OF GOLD MONEY ON DECEMBER 31ST OF 1904 AND 1905.

Compiled from United States Mint Reports.

Table D.	Banks and Treasuries. Million $.				Circulation. Million $.				Grand Totals. Million $.			
GENERAL SUMMARY.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.	1904.	1905.	Decrease.	Increase.
North and South America,	1,072.7	1,184.4	—	**111.7**	465.2	493.5	—	**28.3**	1,537.9	1,677.9	—	**140.0**
Europe	2,030.3	2,028.6	**1.7**	—	1,829.6	2,147.2	—	**317.6**	3,859.9	4,175.8	—	**315.9**
Asia, Africa, and Australasia	261.6	256.3	**5.3**	—	327.7	373.5	—	**45.8**	589.3	629.8	—	**40.5**
Grand totals . . .	3,364.6	3,469.3	—	**104.7**	2,622.5	3,014.2	—	**391.7**	5,987.1	6,483.5	—	**496.4**